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distance between the components of −0·01, that is, they were still in contact.

In the *Astrophysical Journal*, vol. vii. p. 1, Mr. Myers deals with the binary system *β Lyræ*, finding a prolateness of 0·56, and that the stars had just separated.

During the past four months I have had under consideration, on the lines of the present investigation, the variation of *β Lyræ*. I find from a discussion of all available observations a mean eccentricity of figure equal to 0·58, and a mean distance (for 1850) equal to 0·01.

Placing these results in tabulated sequence we have :

System.	Distance between Components.	Prolateness according to	
		Observation.	Theory.
RR Centauri	−0·01	0·78	0·66
β Lyræ	+0·01	0·57	0·58
V Vulpeculæ	+0·24	0·37	0·35

The conclusion here is evident and unmistakable. *The nearer the components are to one another the greater their prolateness, and the amount of prolateness is in fair conformity with what theory alone would indicate.*

The density of *V Vulpeculæ* raises another and perhaps more important issue.

Without going into the numerical operations involved in arriving at the result, it may be stated that the density of the two stars which compose this remarkable binary system cannot be higher than 0·00001.

As is well known Mr. Myers found for the system *β Lyræ* a density of 0·0006.

The question arises at once : Is it possible for bodies so tenuous to hold together as they sweep round one another in rapid revolution ? The question is a legitimate one, but it is beyond the scope of the present paper to deal with it.

My object rather has been to bring forward the variation of *V Vulpeculæ* as proof of a certain definite law of prolateness in close binary systems, and also as proof that such stars are composed of matter of extreme rarity of structure.

New Double Stars. By the Rev. T. E. Espin, M.A.

The following list contains all the new pairs detected since the end of 1902. A large number of them were found during the autumn of 1904 and the spring of the present year, and consequently were too late for insertion in Professor Burnham's new catalogue. In many cases these pairs are too difficult to measure properly with the means at my disposal. Four wide

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pairs have been included, as they are not found in any catalogue so far as I am aware ; but as they are all marked as double in Argelander they have not been numbered.

No.	B.D.	R.A. 1880		Decl.		P.	D.	Mags.		Nights.	Date.	
	°	h	m	°	′	°	″					
151	+39·12	0	2·5	+39	58	196·0	6·4	8·6	12·8	2	04·85	
152	+39·27		7·1	39	33	102·7	7·8	8·5	12·0	3	05·02	
153	+40·42		10·2	40	37	243·1	2·5	9·5	10·5	2	04·73	
154	+53·54		16·2	53	40	191·7	10·2	8·4	9·3	3	02·91	
155	+36·173		52·8	37	7	70·4	6·2	8·7	9·6	2	05·05	
156	+53·234	1	2·5	53	59	216·5	5·2	8·6	11·8	3	03·91	
157	+40·250		6·7	40	31	*f*	10 ±	7·0	13·5	2	04·86	
158	+40·378		42·1	40	22	45·0	6·6	8·5	9·8	1	05·02	
159	+37·386		45·1	37	11	...	5 ±	8·7	14·0	1	04·76	
160	+36·355		49·0	36	40	79·8	17·9	5·2	12·5	2	04·73	
161	+37·420		49·6	37	14	243·4	3·9	9·5	10·7	3	04·77	
162	+36·369		50·6	36	10	204·1	11·1	8·7	12·5	3	04·85	
163	+36·375		50·9	36	11	15·9	5·5	9·4	9·9	3	04·85	
164	+40·475	2	10·6	40	19	...	5 ±	8·7	13·0	1	05·02	
165	+63·435	3	28·1	63	49	171·9	3·7	9·9	10·4	3	04·05	
166	+39·844		33·7	39	19	357 ±	4 ±	8·5	13·0	1	05·02	
167	+34·730		39·8	34	58	322·6	4·4	9·0	9·1	3	04·86	
168	+36·868	4	11·8	36	26	273·2	6·7	8·5	11·5	3	05·16	
...	+59·793		12·7	59	20	58·9	32·1	6·0	8·8	1	04·07	
169	+39·1191	5	0·6	39	20	176·5	4·5	8·3	12·0	2	05·03	
170	+34·978		7·8	34	17	23·4	12·7	8·0	10·1	2	05·16	
171	+62·756		18·5	62	35	222·9	2·3	8·7	10·5	1	04·06	
172	+39·1397		36·6	39	47	135·4	4·9	9·0	10·0	1	05·02	
173	+39·1404		37·7	39	10	N.F.	4 ±	8·5	12·5	1	05·03	
174	Anon.	6	27·9	36	55	108·7	3·0	9·6	9·8	2	05·10	
175	+36·1498		38·0	36	35	79·4	6·4	8·9	9·4	1	05·10	
176	+34·1451		38·3	34	26	70 ±	6 ±	8·8	12·0	1	05·15	AB
						45 ±	6 ±		12·5	1	05·15	AC
177	+37·1582		38·8	37	4	...	6 ±	9·5	10·5	1	05·07	BC
							70 ±	A = 8·5		1	05·07	AB
178	+40·1776		53·5	40	1	247·7	6·6	9·5	11·5	2	00·51	BC
						151·3	8·5	A = 9·4		2	00·51	AB
179	Anon.	7	49·0	38	2	...	4 ±	9·5	9·5	1	05·07	
180	+36·2033	10	1·5	36	10	349·6	9·6	9·0	11·0	1	05·25	
181	+36·2166	11	6·6	36	22	142·9	5·4	9·1	10·7	3	05·29	
...	+34·2264		44·9	33	54	273·7	45·2	6·0	8·5	2	05·34	

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No.	B.D.	R.A. 1880		Decl.		P.	D.	Mags.		Nights.	Date.	
	°	h	m	°	′	°	″					
182	+63·1346	17	21·4	63	51	19·1	6·5	9·0	11·5	4	03·60	
183	+36·3026	18	4·7	36	41	163·0	9·8	8·7	12·0	3	04·74	
184	+32·3056		4·7	32	54	157·2	5·5	9·0	11·2	2	04·73	
185	+32·3064		6·6	32	57	296·6	5·5	8·8	9·4	4	04·76	
186	+64·1256		15·6	64	1	332·7	8·6	8·2	12·0	2	03·61	
187	+51·2372		20·9	51	35	198·7	2·7	8·6	8·7	4	03·76	
188	+58·1824		31·5	58	36	224·8	11·7	8·2	13·7	2	02·81	
189	+60·1844		42·4	60	32	103·6	4·3	9·1	11·1	1	03·88	
190	+33·3228		46·1	33	4	236·0	4·2	11·5	12·0	3	04·62	BC
						295·1	12·9	A =	9·5	2	04·61	AB
191	+61·1816	19	5·2	61	4	243·9	6·1	9·1	9·8	1	03·60	
192	+59·1979		12·7	59	33	116·3	7·4	9·0	11·6	2	03·63	
193	+59·1981		13·3	59	34	113·7	8·1	8·8	11·7	2	03·63	
194	+64·1346		20·2	64	18	216·3	4·4	8·8	9·9	3	03·68	
195	+33·3496		27·9	34	2	239·5	5·6	8·3	9·0	4	04·75	
196	+32·3467		28·5	33	3	48·7	4·5	9·0	12·0	1	04·69	
197	+64·1364		35·6	64	47	19·3	8·9	8·5	10·5	3	03·68	
198	+64·1369		37·8	64	39	313·7	2·7	8·8	9·4	3	03·68	
199	+64·1386		46·3	64	23	70·7	6·5	8·0	10·5	1	03·88	
200	+34·3791		50·7	34	15	229·0	4·5	10·0	10·0	2	04·75	
201	+59·2160		57·3	59	25	145·0	4·1	9·0	11·5	1	03·64	
202	+34·3850		57·9	34	59	180 ±	6 ±	8·7	14·0		04·83	A*a*
						100·0	17·3	B =	10·5	3	04·83	AB
						110·7	5·5	*b*	13·0	2	04·86	B*b*
						162·8	12·3	C	11·5	2	04·86	AC
						134·8	23·6	D	11·8	2	04·86	AD
203	+35·3983	20	3·8	35	7	131·4	5·8	8·5	10·0	2	04·94	
204	+34·3930		9·7	35	1	238·4	11·0	8·1	12·0	2	04·66	
205	+34·3936		10·4	34	38	195·5	6·6	8·8	10·7	2	04·95	
206	+37·3949		24·3	37	47	127·1	4·1	8·9	9·3	2	04·79	
...	+57·2240		42·5	57	9	162·7	68·6	5·0	8·7	3	02·83	
207	+37·4213	21	6·4	37	51	244·3	2·5	9·5	9·6	1	04·95	
208	+36·4469		8·5	37	4	143·0	3·7	8·8	10·7	2	04·82	
209	+52·2883		8·7	52	48	...	4 ±	9·0	12·0	1	03·69	
210	+32·4270		44·5	32	47	111·4	6·5	9·2	10·5	2	04·82	
211	+39·4683		45·6	39	11	196·9	2·6	9·5	10·5	1	04·77	
212	+64·1608		53·0	65	5	Double	...	9·0	...	1	03·60	
213	+63·1814	22	5·8	63	31	...	4 ±	9	11	1	03·60	
214	+34·4634		10·1	34	11	170·4	3·5	9·0	12·0	1	04·69	

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No.	B.D.	R.A. 1880		Decl.		P.	D.	Mags.		Nights.	Date.
	°	h	m	°	′	°	″				
215	+34·4635		10·2	34	18	141·7	8·8	8·8	12·5	1	04·69
216	+35·4850		32·3	36	4	...	4 ±	11	13	1	04·78 BC
						38·0	44·3	A = 8·3		1	04·78 AB
217	+36·4925		40·0	36	17	...	3 ±	10	11	1	04·78 BC
							70 ±	A = 8·7		1	04·78 AB
...	+35·4917		50·1	35	43	243·0	49·6	5·0	8·5	2	04·77
218	...		51·9	64	9	330·5	2·8	11·0	12·0	1	02·73 BC
						296·4	19·1	A = 10		1	02·73 AB (*h* 1833)
219	+35·5001	23	12·8	35	42	309·8	6·1	9·8	10·2	3	04·96
220	+61·2430		15·6	61	45	...	4·0	11·5	12·5	1	04·02 BC
							30 ±	A = 8·0		1	04·02 AB
221	+35·5153		54·7	36	7	233·9	14·8	8·1	8·8	3	04·87

Notes.

163. Measures discordant.

165. Discordant angles.

168. Discordant angles.

174. 42″ N. 10 sec *p* B.D. + 36°·1528.

175. *h* 5284 is south.

182. According to the list of proper motions in the Harvard section of the Catalogue of the Astron. Gesell., this star has a P.M. in Decl of + 0″·103. If B was stationary the distance between the stars would have been 0″·9 at the time of the Harvard observation.

184. Discordant angles.

197. Discordant angles.

202. October 8, A*a* too faint to measure, another still further in the same direction. November 12, glimpsed A*a* and thought it the first of three in a line. November 14, A*a* seen—not sure that there is not a nearer and still fainter one.

204. Discordant distances.

205. Discordant angles.

207. Faint and unsteady poor measures.

212. No particulars, simple entered as double.

213. The fainter star of a wide pair.

219. Discordant angles.

Additional Note.—Since the above paper was presented Professor Hussey's ninth catalogue of new double stars has been received, and No. 195 was found to be identical with Hussey 946 :—

195. 8·0 and 10·0. 240°·8 – 5″·25. 1904·47. Hussey. 2.

On the Determination of Proper Motions without Reference to Meridian Places. By Arthur R. Hinks, M.A.

The purpose of this note is to suggest that the application of photography to the determination of the proper motion of stars leads naturally to an inversion of our ideas in respect of the origin to which these proper motions should be referred. The